Large Aspen Tortrix

Larvae in rolled leaves

Name and Description—*Choristoneura conflictana* (Walker) [Lepidoptera: Tortricidae]

The adult large aspen tortrix is a moth with a wingspread of 1-1 1/4 inches (2.5-3.0 cm) (fig. 1). The forewing is grayish with basal, middle, and outer brownish patches. Oval, pale green eggs are laid in rows that overlap like fish scales, forming large, flat masses (fig. 2). Young larvae have yellowish or pale green bodies and black heads. With each molt, larvae darken in color. Mature larvae are about 3/4 inch (15-21 mm) long and are grey-green to nearly black with dark spots on each segment and a dark shield and head (figs. 3-4). Pupae are light green when first formed but soon change to a reddish brown to black color (fig. 4). Large aspen tortrix is a transcontinental, principally boreal species, occurring from Alaska to New Mexico, distributed along with its principal host, aspen.

Figure 1. Adult large aspen tortrix. *Photo: Steven Katovich, USDA Forest Service, Bugwood.org.*

Hosts—Aspen. During epidemics when aspen is completely defoliated, larvae will feed on other associated broad-leaved trees such as alder, birch, cottonwood, chokecherry, and willow and may consume the foliage of understory plants when starving.

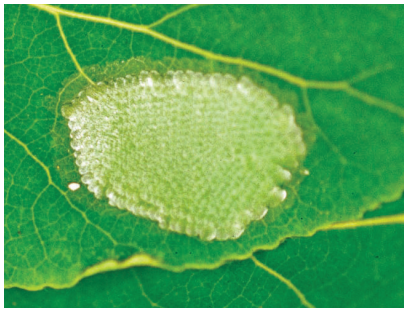

Figure 2. Unhatched egg mass of large aspen tortrix. *Photo: Steven Katovich, USDA Forest Service, Bugwood.org.*

Life Cycle—There is one generation per year. Eggs are laid in mid-June through July, mainly on the upper surfaces of leaves but almost anywhere if no aspen foliage is available. Newly hatched larvae feed on leaf tissue but not veins, skeletonizing the leaf. Young larvae are often gregarious and can be found feeding within previously rolled leaves in old pupation sites. Dispersal to hibernation sites such as bark crevices and other protected places begins in early August and is completed by September. Larvae molt once and then overwinter within hibernaculae, which are white silk casings that each larva spins around itself. On warm days in early spring, the small larvae emerge from hibernaculae and move up the stems of aspen. The larvae mine into the buds, feeding on the young tissue. At this stage, secondary hibernaculae are often constructed at the base of the buds. In later stages, the larvae roll (fig. 4), fold (fig. 5), or web leaves into shelters, within which they feed and eventually pupate. When disturbed, larvae writhe vigorously and often drop, suspended by a silk thread. During epidemics, larvae frequently wander in search of food, resulting in extensive webbing that covers grass and understory plants. Pupation occurs from mid-June to mid-July, depending upon location and weather, and lasts about 10 days. Adults are active for about a 2-week period from late June through July. Females are sluggish and stay in the area of emergence, whereas males are more energetic and erratic in flight.

Figure 3. Mature, light green larva of large aspen tortrix. *Photo: William M. Ciesla, Forest Health Management International, Bugwood.org.*

Figure 4. Dark green larva of large aspen tortrix. *Photo: K.B. Jamieson, Canadian Forest Service, Bugwood.org.*

Damage—Large aspen tortrix becomes a problem only where aspen is a major component of the forest stand. Entire aspen stands and vast aspen forests have been completely defoliated

during outbreaks. Larval feeding in early spring sometimes causes complete defoliation before the buds have expanded.

Healthy, defoliated aspen usually grow new leaves by midsummer, but they are often smaller and fewer than normal, resulting in thinned crowns. Copious amounts of silk webbing in the understory can be annoying to people walking through heavily defoliated aspen stands. Growth loss is the major impact in the early stages of an outbreak. Repeated defoliation over a period of years can cause branch death that is most noticeable in trees growing on marginal sites. Weakened aspen are more susceptible to opportunistic agents such as plant diseases and insects. Despite growth loss, aspen usually withstand large aspen tortrix outbreaks with little tree mortality.

Figure 4. Pupa of large aspen tortrix protruding from leaf shelter. *Photo: William M. Ciesla, Forest Health Management International, Bugwood.org.*

Figure 5.Leaf roll held together by silk. *Photo: Steven Katovich, USDA Forest Service, Bugwood.org.*

The impact of an outbreak depends upon many factors, primarily the frequency and severity of defoliation. Other considerations include wildlife use and recreational and aesthetic values of the aspen stand. Defoliation alone can reduce values, especially in high-use areas.

There are numerous similar looking caterpillar species on aspen that roll, tie, or fold leaves, many of which are also in the family Tortricidae. All are of minor consequence. Increases in large aspen tortrix populations are sometimes associated with increases in the populations of other aspen feeding insect species, such as tent caterpillars or leafminers.

Management—Outbreaks are characterized by the build-up of large populations that persist for 2 or 3 years and then suddenly collapse without human intervention. Though natural enemies, including insects, diseases, and birds, feed upon large aspen tortrix, the most significant contributors to outbreak collapse are thought to be starvation and other debilitating effects of foliage depletion, as well as unseasonable cold weather early in spring that either kills young larvae or reduces their food supply by harming leaf tissue. Aspen can tolerate significant defoliation. Because of the short duration of outbreaks of large aspen tortrix and associated insect defoliators, direct control is not generally recommended. In high-use areas like campgrounds, applying registered chemical or biological insecticides may be appropriate in order to reduce defoliation, masses of webbing in the understory, or aesthetic damage.

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